

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): ~~A printing method for printing an image on a medium, comprising the following steps~~A method for obtaining a correction value that is for correcting and printing an image constituted by a plurality of dot lines, comprising:

printing a correction pattern based on a first gradation value by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming a plurality of dot lines in an intersecting direction that intersects the movement direction;

obtaining, for each dot line, first information corresponding to the first gradation value by measuring a darkness of the correction pattern dot line by dot line; and

~~printing an image constituted by a plurality of corrected dot lines on the medium by correcting each dot line~~obtaining the correction value for each dot line in accordance with the first information and second information corresponding to a second gradation value that is different from the first gradation value,

wherein a correction pattern based on the second gradation value is printed; and
the second information corresponding to the second gradation value is obtained for each dot line by measuring a darkness of the correction pattern dot line by dot line.

2. - 3. (canceled).

4. (currently amended): ~~The~~A printing method according to claim ~~31~~,
wherein the darkness of the correction pattern based on the first gradation value and the
darkness of the correction pattern based on the second gradation value are measured dot line by
dot line, and the correction value is determined from the measurement value of each dot line.

5. (canceled).

6. (currently amended): ~~The~~A printing method according to claim ~~51~~,
wherein a plurality of the nozzles are provided for each color of the ink; and
the correction value is calculated for each color by printing the correction pattern in each
color; and, the correction value of each color being for correcting the darkness of the image for
each color.

~~the darkness of the image is corrected for each color in accordance with the correction~~
~~value of each color.~~

7. (currently amended): ~~A. The printing~~ method according to claim ~~31~~,
wherein a gradation value at which the darkness becomes a target value is determined by
performing a linear interpolation using two information pairs, the two information pairs being a
pair made up of the gradation value and the measurement value of one of the two correction
patterns and a pair made up of the gradation value and the measurement value of the other of the
two correction patterns; and

a value obtained by dividing a deviation between the determined gradation value and a reference gradation value corresponding to the target value by that reference gradation value is taken as the correction value.

8. (currently amended): ~~A~~ The printing method according to claim 7,
wherein the gradation value of one of the two information pairs is higher than the reference value and the gradation value of the other is smaller than the reference value.

9. (currently amended): ~~The~~ A printing method according to claim 7,
wherein the gradation value of one of the two information pairs is the same value as the reference value.

10. (currently amended): A method for obtaining a correction value that is for correcting and printing an image constituted by a plurality of dot lines, comprising:
printing a correction pattern based on a first gradation value by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming the plurality of dot lines in an intersecting direction that intersects the movement directions;
obtaining, for each dot line, first information corresponding to the first gradation value by measuring a darkness of the correction pattern dot line by dot line; and
obtaining the correction value for each dot line in accordance with the first information and second information corresponding to a second gradation value that is different from the first gradation value.
~~A printing method according to claim 2,~~

wherein three information pairs are obtained, the three information pairs being a pair made up of the gradation value and a measurement value of one of three correction patterns that are each based on a different gradation value, a pair made up of the gradation value and a measurement value of another one of the three correction patterns, and a pair made up of the gradation value and a measurement value of yet another one of the three correction patterns;

if a darkness target value is higher than the second largest measurement value of the three information pairs, then a gradation value at which the darkness becomes the target value is determined by linear interpolation using the information including this second largest measurement value and the information including the measurement value higher than the second largest measurement value;

if the darkness target value is smaller than the second largest measurement value of the three information pairs, then the gradation value at which the darkness becomes the target value is determined by linear interpolation using the information including this second largest measurement value and the information including the measurement value smaller than the second largest measurement value; and

a value obtained by dividing a deviation between the determined gradation value and a reference gradation value corresponding to the target value by that reference gradation value is taken as the correction value.

11. (currently amended): ~~A~~The printing method according to claim 10,
wherein the second largest gradation value is the same value as the reference value.

12. (currently amended): ~~A~~The printing method according to claim 10,

wherein the target value is an average value of darkness measurement values of all dot lines in the correction pattern based on the second gradation value of the three gradation values.

13. (currently amended): ~~The~~A printing method according to claim 7,
wherein the target value is a darkness measurement value of a darkness sample
representing the darkness of the reference value.

14. (currently amended): ~~The~~A printing method according to claim 7,
wherein the reference value is selected from a darkness range of a middle-tone region.

15. (currently amended): ~~The~~A printing method according to claim 1,
wherein the darkness measurement value is a grey-scale measurement value.

16. (currently amended): A printing method for printing an image on a medium,
comprising:
printing a correction pattern based on a first gradation value by ejecting ink from a
plurality of nozzles moving in a predetermined movement direction and forming a plurality of
dot lines in an intersecting direction that intersects the movement direction;
obtaining, for each dot line, first information corresponding to the first gradation value by
measuring a darkness of the correction pattern dot line by dot line; and
printing an image constituted by a plurality of corrected dot lines on the medium by
correcting each dot line in accordance with the first information and second information
corresponding to a second gradation value that is different from the first gradation value,

wherein a correction value is calculated for each dot line based on the first information and the second information; and

an image that is constituted by a plurality of the dot lines that have been corrected respectively in accordance with the correction value is printed on the medium.~~A printing method according to claim 2,~~

wherein the image data for printing the image includes a gradation value for each dot formation unit formed on the medium;

if no correction value is associated with these formation units, then:

based on a creation ratio table associating the gradation values with the dot creation ratios, the creation ratio corresponding to the gradation value of the formation unit is read out; and

dots are formed in each formation unit on the medium in accordance with the creation ratio that has been read out; and

if the correction value is associated with these formation units, then:

when reading the creation ratio corresponding to a gradation value from the creation ratio table, the creation ratio corresponding to a value obtained by changing the gradation value by the correction value is read out; and

dots are formed in each formation unit on the medium in accordance with the creation ratio that has been read out.

17. (original): A printing method according to claim 16,

wherein the dot creation ratio indicates a proportion of a number of dots formed within a region that has a uniform gradation value and that is made of a predetermined number of the formation units, to that predetermined number.

18. (original): A printing method according to claim 16,
wherein the nozzle can form dots of a plurality of sizes; and
in the creation ratio table, a relation between the creation ratios and the gradation values is set for each size of dots.

19. (currently amended): ~~The~~A printing method according to claim 1,
wherein the darkness of the correction pattern is measured using a darkness measuring device that measures darkness optically.

20. (currently amended): ~~The~~A printing method according to claim 1,
wherein correction patterns are printed based respectively on specified gradation values including the first gradation value and the second gradation value, for each of the specified gradation values.

21. (currently amended): ~~The~~A printing method according to claim 20,
wherein the first information is obtained by determining a new gradation value for forming a darkness corresponding to the first gradation value by performing a linear interpolation using information in which the first gradation value and the measurement value of the correction pattern based on the first gradation value are associated and information in which

a specified gradation value that is different from the first gradation value and a measurement value of the correction pattern based on that specified gradation value are associated, and associating the determined new gradation value and the first gradation value; and

the second information is obtained by determining a new gradation value for forming a darkness corresponding to the second gradation value by performing a linear interpolation using information in which the second gradation value and a measurement value of the correction pattern based on the second gradation value are associated and information in which a specified gradation value that is different from the second gradation value and a measurement value of the correction pattern based on that specified gradation value are associated, and associating the determined new gradation value and the second gradation value.

22. (currently amended): A method for obtaining a correction value that is for correcting and printing an image constituted by a plurality of dot lines, comprising:
printing a correction pattern based on a first gradation value by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming the plurality of dot lines in an intersecting direction that intersects the movement direction;
obtaining, for each dot line, first information corresponding to the first gradation value by measuring a darkness of the correction pattern dot line by dot line; and
obtaining the correction value for each dot line in accordance with the first information and second information corresponding to a second gradation value that is different from the first gradation value.~~A printing method according to claim 1,~~

wherein correction patterns are printed based respectively on specified gradation values including the first gradation value, for each of the specified gradation values;

the first information is obtained by determining a new gradation value for forming a darkness corresponding to the first gradation value by performing a linear interpolation using information in which the first gradation value and the measurement value of the correction pattern based on the first gradation value are associated and information in which a specified gradation value that is different from the first gradation value and a measurement value of the correction pattern based on that specified gradation value are associated, and associating the determined new gradation value and the first gradation value; and

the second information corresponds to the second gradation value at which the printable gradation value becomes highest.

23. (currently amended): A method for obtaining a correction value that is for correcting and printing an image constituted by a plurality of dot lines, comprising:
printing a correction pattern based on a first gradation value by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming the plurality of dot lines in an intersecting direction that intersects the movement direction;
obtaining, for each dot line, first information corresponding to the first gradation value by measuring a darkness of the correction pattern dot line by dot line; and
obtaining the correction value for each dot line in accordance with the first information and second information corresponding to a second gradation value that is different from the first gradation value.~~A printing method according to claim 1,~~

wherein correction patterns are printed based respectively on specified gradation values including the first gradation value, for each of the specified gradation values;

the first information is obtained by determining a new gradation value for forming a darkness corresponding to the first gradation value by performing a linear interpolation using information in which the first gradation value and the measurement value of the correction pattern based on the first gradation value are associated and information in which a specified gradation value that is different from the first gradation value and a measurement value of the correction pattern based on that specified gradation value are associated, and associating the determined new gradation value and the first gradation value; and

the second information corresponds to the second gradation value at which the printable gradation value becomes lowest.

24. (currently amended): ~~The A printing method~~ according to claim 21,

wherein the information in which the first gradation value and the measurement value of the correction pattern based on the first gradation value are associated, information in which a specified gradation value that is higher than the first gradation value and a measurement value of the correction pattern based on this specified gradation value are associated, and information in which a specified gradation value that is lower than the first gradation value and a measurement value of the correction pattern based on this specified gradation value are associated are obtained;

if the darkness corresponding to the first gradation value is higher than the measurement value of the correction pattern based on the first gradation value, then a linear interpolation is performed using the information in which the first gradation value and the measurement value of the correction pattern based on the first gradation value are associated, and the information in which the specified gradation value that is higher than the first gradation value and the

measurement value of the correction pattern based on this specified gradation value are associated;

if the darkness corresponding to the first gradation value is smaller than the measurement value of the correction pattern based on the first gradation value, then a linear interpolation is performed using the information in which the first gradation value and the measurement value of the correction pattern based on the first gradation value are associated, and the information in which the specified gradation value that is lower than the first gradation value and the measurement value of the correction pattern based on this specified gradation value are associated; and

a new gradation value for forming the darkness corresponding to the first gradation value is determined.

25. (currently amended): ~~The A printing~~ method according to claim 24, wherein an average value of the darkness of each dot line constituting the correction pattern based on the first gradation value is taken as the darkness corresponding to the first gradation value.

26. (currently amended): ~~The A printing~~ method according to claim 24, wherein a darkness measurement value of a darkness sample is taken as the darkness corresponding to the first gradation value.

27. (currently amended): ~~The A printing~~ method according to claim 1,

wherein the image data for printing the image includes a gradation value for each dot formation unit formed on the medium; and

the darkness of each of the dot lines is corrected by correcting the gradation value of each of the formation units.

28. (currently amended): A method for obtaining a correction value that is for correcting and printing an image constituted by a plurality of dot lines, comprising:
printing a correction pattern based on a first gradation value by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming the plurality of dot lines in an intersecting direction that intersects the movement direction;
obtaining, for each dot line, first information corresponding to the first gradation value by measuring a darkness of the correction pattern dot line by dot line; and
obtaining the correction value for each dot line in accordance with the first information and second information corresponding to a second gradation value that is different from the first gradation value.~~A printing method according to claim 1,~~

wherein a new gradation value for forming a darkness corresponding to a gradation value other than the first gradation value and the second gradation value is determined by linear interpolation of the first information and the second information.

29. (currently amended): ~~The~~A printing method according to claim 1,
wherein the correction value is for correcting a dot creation ratio for a gradation value~~is corrected based on the first information and the second information.~~

30. (currently amended): A method for obtaining a correction value that is for correcting and printing an image constituted by a plurality of dot lines, comprising:
printing a correction pattern based on a first gradation value by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming the plurality of dot lines in an intersecting direction that intersects the movement direction;
obtaining, for each dot line, first information corresponding to the first gradation value by measuring a darkness of the correction pattern dot line by dot line; and
obtaining the correction value for each dot line in accordance with the first information and second information corresponding to a second gradation value that is different from the first gradation value,
wherein the correction value is for correcting a dot creation ratio for a gradation value,
and A printing method according to claim 29,
wherein a dot creation ratio for a gradation value other than the first gradation value and the second gradation value is determined by linear interpolation of a dot creation ratio of the first gradation value and a dot creation ratio of the second gradation value.

31. (currently amended): ~~A. The printing method according to claim 1,~~
wherein a plurality of the nozzles are provided for each color of the ink;
the first information is obtained for each color by printing the correction pattern based on the first information in each color; and
each dot line is corrected, color by color, in accordance with the first information and the second information.

32. (original): A printing method for printing an image on a medium, comprising the following steps:

printing a correction pattern based on a first gradation value and a correction pattern based on a second gradation value different from the first gradation value by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming a plurality of dot lines in an intersecting direction that intersects the movement direction;

obtaining, for each dot line, first information corresponding to the first gradation value and second information corresponding to the second gradation value by measuring a darkness of the correction pattern dot line by dot line;

wherein a correction value is calculated for each dot line based on the first information and the second information; and

an image that is constituted by a plurality of the dot lines that have been corrected respectively in accordance with the correction value is printed on the medium;

wherein:

a plurality of the dot lines are formed in the intersecting direction through alternate repetition of a dot formation operation of forming dots on the medium by ejecting ink from the plurality of nozzles moving in the movement direction and a carrying operation of carrying the medium in the intersecting direction intersecting the movement direction;

a plurality of the nozzles are provided for each color of the ink;

the correction value is calculated for each color by printing the correction pattern in each color; and

the darkness of the image is corrected for each color in accordance with the correction value of each color;

three information pairs are obtained, the three information pairs being a pair made up of the gradation value and a measurement value of one of three correction patterns that are each based on a different gradation value, a pair made up of the gradation value and a measurement value of another one of the three correction patterns, and a pair made up of the gradation value and a measurement value of yet another one of the three correction patterns;

if a darkness target value is higher than the second largest measurement value of the three information pairs, then a gradation value at which the darkness becomes the target value is determined by linear interpolation using the information including this second largest measurement value and the information including the measurement value higher than the second largest measurement value;

if the darkness target value is smaller than the second largest measurement value of the three information pairs, then the gradation value at which the darkness becomes the target value is determined by linear interpolation using the information including this second largest measurement value and the information including the measurement value smaller than the second largest measurement value; and

a value obtained by dividing a deviation between the determined gradation value and a reference gradation value corresponding to the target value by that reference gradation value is taken as the correction value;

the second largest gradation value is the same value as the reference value;

the target value is an average value of darkness measurement values of all dot lines in the correction pattern based on the second gradation value of the three gradation values;

the target value is a darkness measurement value of a darkness sample representing the darkness of the reference value;

the reference value is selected from a darkness range of a middle-tone region;

the darkness measurement value is a grey-scale measurement value;

the image data for printing the image includes a gradation value for each dot formation unit formed on the medium;

if no correction value is associated with these formation units, then:

based on a creation ratio table associating the gradation values with the dot creation ratios, the creation ratio corresponding to the gradation value of the formation unit is read out; and

dots are formed in each formation unit on the medium in accordance with the creation ratio that has been read out; and

if the correction value is associated with these formation units, then:

when reading the creation ratio corresponding to a gradation value from the creation ratio table, the creation ratio corresponding to a value obtained by changing the gradation value by the correction value is read out; and

dots are formed in each formation unit on the medium in accordance with the creation ratio that has been read out;

the dot creation ratio indicates a proportion of a number of dots formed within a region that has a uniform gradation value and that is made of a predetermined number of the formation units, to that predetermined number;

the nozzle can form dots of a plurality of sizes; and

in the creation ratio table, a relation between the creation ratios and the gradation values is set for each size of dots; and

the darkness of the correction pattern is measured using a darkness measuring device that measures darkness optically.

33. (original): A printing method for printing an image on a medium, comprising the following steps:

printing a correction pattern based on a first gradation value by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming a plurality of dot lines in an intersecting direction that intersects the movement direction;

obtaining, for each dot line, first information corresponding to the first gradation value by measuring a darkness of the correction pattern dot line by dot line; and

printing an image constituted by a plurality of corrected dot lines on the medium by correcting each dot line in accordance with the first information and second information corresponding to a second gradation value that is different from the first gradation value;

wherein:

correction patterns are printed based respectively on specified gradation values including the first gradation value, for each of the specified gradation values;

the first information is obtained by determining a new gradation value for forming a darkness corresponding to the first gradation value by performing a linear interpolation using information in which the first gradation value and the measurement value of the correction pattern based on the first gradation value are associated and information in which a specified gradation value that is different from the first gradation value and a measurement value of the correction pattern based on that specified gradation value are associated, and associating the determined new gradation value and the first gradation value; and

the second information corresponds to the second gradation value at which the printable gradation value becomes highest or lowest;

the information in which the first gradation value and the measurement value of the correction pattern based on the first gradation value are associated, information in which a specified gradation value that is higher than the first gradation value and a measurement value of the correction pattern based on this specified gradation value are associated, and information in which a specified gradation value that is lower than the first gradation value and a measurement value of the correction pattern based on this specified gradation value are associated are obtained;

if the darkness corresponding to the first gradation value is higher than the measurement value of the correction pattern based on the first gradation value, then a linear interpolation is performed using the information in which the first gradation value and the measurement value of the correction pattern based on the first gradation value are associated, and the information in which the specified gradation value that is higher than

the first gradation value and the measurement value of the correction pattern based on this specified gradation value are associated;

if the darkness corresponding to the first gradation value is smaller than the measurement value of the correction pattern based on the first gradation value, then a linear interpolation is performed using the information in which the first gradation value and the measurement value of the correction pattern based on the first gradation value are associated, and the information in which the specified gradation value that is lower than the first gradation value and the measurement value of the correction pattern based on this specified gradation value are associated, and

a new gradation value for forming the darkness corresponding to the first gradation value is determined;

an average value of the darkness of each dot line constituting the correction pattern based on the first gradation value is taken as the darkness corresponding to the first gradation value;

the image data for printing the image includes a gradation value for each dot formation unit formed on the medium; and

the darkness of each of the dot lines is corrected by correcting the gradation value of each of the formation units;

a new gradation value for forming a darkness corresponding to a gradation value other than the first gradation value and the second gradation value is determined by linear interpolation of the first information and the second information;

a dot creation ratio for a gradation value is corrected based on the first information and the second information;

a dot creation ratio for a gradation value other than the first gradation value and the second gradation value is determined by linear interpolation of a dot creation ratio of the first gradation value and a dot creation ratio of the second gradation value;

a plurality of the nozzles are provided for each color of the ink;

the first information is obtained for each color by printing the correction pattern based on the first information in each color; and

each dot line is corrected, color by color, in accordance with the first information and the second information.

34 - 36. (canceled).